

Q3 receive said rule if said rule [is invalid] conflicts with another rule in the hierarchical order in order to guide the user in selecting and applying repairs to [make the rule valid] avoid the conflict.

17. (Amended) [The agent manager described in claim 16,] An agent manager for a personal software agent, the agent manager having an input device for receiving instructions from a user, comprising:

a rule edit module having a rule edit input coupled to the input device for receiving instructions from the user for creating a rule by entering conditions, attributes and actions to define said rule, and having a rule edit output;

Q4 a rule index module having a rule index input coupled to said rule edit output for receiving said rule and placing said rule in a hierarchical order comprised of parent rules, child rules, sibling rules, and inter rules to create structured descriptions of sets of objects and individual object, and having a rule index output and wherein said rule index module inherits actions from said parent rules to said rule, inherits actions from said rule to said child rules, and inherits actions from the intersection of said rule and said sibling rules to said inter rules;

a rule analysis module having a rule analysis input coupled to said rule index output for receiving said hierarchical order and using said hierarchical order for determining whether said rule is valid, and having a rule analysis output; and

a rule repair module having a rule repair input coupled to said rule analysis output to receive said rule if said rule is invalid in order to guide the user in selecting and applying repairs to make the rule valid.

Q5 24. (Amended) Apparatus for automatically verifying whether a new rule which is to be added to a set of rules to control a personal software agent is valid with respect to the set of rules, each rule specifying a set of conditions and a sequence of actions being interpreted in a system which causes the actions specified in the rule to be performed when the conditions specified in the rule are satisfied, the apparatus comprising:

a stored subsumption hierarchy of the rules in the set of rules;

Q1. suggesting repairs to said rule if said rule [is invalid] conflicts with another rule.

5. (Amended) [The method described in claim 4,] A method for a user to program a personal software agent using an agent manager, wherein said agent manager is connected to an input device for receiving instructions from the user, comprising the steps of:

creating a rule by defining said rule's conditions, attributes and actions;

Q2 placing said rule in an hierarchical order comprised of parent rules, child rules, sibling rules, and inter rules, wherein said rule inherits actions from said parent rules, wherein said child rules inherit [inherits] actions from said rule, and said inter rules inherit [inherits] actions from the intersection of said rule and said sibling rules;

determining whether said rule is valid within said hierarchical order; and

suggesting repairs to said rule if said rule is invalid.

6. (Amended) The method described in claim 5, wherein said rule is placed in said hierarchical order using CLASSIC and CLASSIC determines subsumption relations among rules.

12. (Amended) An agent manager for a personal software agent, the agent manager having an input device for receiving instructions from a user, comprising:

Q3 a rule edit module having a rule edit input coupled to the input device for receiving instructions from the user for creating a rule to control the personal software agent, and having a rule edit output;

a rule index module having a rule index input coupled to said rule edit output for receiving said rule and placing said rule in a hierarchical order of rules to control the personal software agent, and having a rule index output;

a rule analysis module having a rule analysis input coupled to said rule index output for receiving said hierarchical order and using said hierarchical order for determining whether said rule [is valid] conflicts with another rule in the hierarchical order, and having a rule analysis output; and

a rule repair module having a rule repair input coupled to said rule analysis output to

means for placing the new rule to control the personal software agent in the subsumption hierarchy; and

means for using the subsumption hierarchy which includes the new rule to determine whether the new rule [is valid] conflicts with another rule in the hierarchy and provide an indication [of invalidity] when [is not valid] a conflict exists.

25. (Amended) The apparatus described in claim 24, wherein the means for using the subsumption hierarchy further uses the subsumption hierarchy to determine a suggested correction for the new rule when the new rule [is not valid] conflicts with another rule and provide the suggested correction.

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27. (Amended) [The apparatus described in claim 26,] Apparatus for automatically verifying whether a new rule which is to be added to a set of rules is valid with respect to the set of rules, each rule specifying a set of conditions and a sequence of actions being interpreted in a system which causes the actions specified in the rule to be performed when the conditions specified in the rule are satisfied, the apparatus comprising:

a stored subsumption hierarchy of the rules in the set of rules;

means for placing the new rule in the subsumption hierarchy;

means for using the subsumption hierarchy which includes the new rule to determine whether the new rule is valid, and provide an indication of invalidity when the new rule is not valid and further using the subsumption hierarchy to determine a suggested correction for the new rule when the new rule is not valid and provide the suggested correction, wherein the means for using the subsumption hierarchy determines whether the new rule is valid by using the subsumption hierarchy to determine whether the conditions of the new rule and another rule of the set of rules can apply simultaneously and if the conditions do so apply, analyzing the actions of the rules for conflicts; and

comprising means responsive to an input from a user of the apparatus indicating acceptance of the suggested correction for correcting the new rule according to the suggested correction.